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PREVALENCE OF PULMONARY HYPERTENSION IN PATIENTS WITH END STAGE RENAL DISEASE AND ACUTE EFFECT OF HEMODIALYSIS ON RIGHT VENTRICULAR HEMODYNAMICS AND FUNCTION - PRELIMINARY ECHOCARDIOGRAPHIC FINDINGS FROM THE PROSPECTIVE PEPPER- STUDY

ACC Poster Contributions
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Session Title: Echocardiography: 3-D, TEE, and Intracardiac Echo
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Background: Pulmonary arterial hypertension (PAH) is defined as a group of diseases leading to right ventricular (RV) failure and premature death. The reasons to develop pulmonary hypertension (PH) are multifactorial, and PH is a frequent finding in patients with end- stage renal disease (ESRD). The aims of this study were (a) to determine the prevalence of P(A)H in patients with ESRD, (b) to evaluate PH dependent changes in RV-function, (c) to determine the acute influence of hemodialysis on RV- hemodynamics and (d) to determine risk factors predicting patient- outcome.

Methods and **Results:** 29 patients with ESRD were prospectively enrolled to the study. 2D- and 3D- transthoracic echocardiography (TTE) before and after hemodialysis identified 14 patients (51.8%) with systolic pulmonary artery pressure (PAPs) >35 mmHg (5 [18.5%], PAPs >55mmHg; 2 [7.4%],PAPs ≥ 70mmHg). After hemodialysis PAPs significantly decreased from a mean of 40.6±13.9 mmHg to 33.4±13.8mmHg (PAPs >35 mmHg, 8 [29.6%]; PAPs > 55mmHg, 3 [11.1%]; PAPs ≥ 70mmHg,1 [3.7%]). Hemodialysis increased RV-deformation-capabilities as determined with 2D-speckle-tracking (longitudinal-2D-strain [%]: -16.2 ± 4.6 versus -21.4 ± 3.9, $p<0.05$) and RV function as determined with 3D- TTE (EF [%]: 43.4±9.7% versus 52.6 ± 9.4%, $p<0.05$). RV-volumes and LV systolic and diastolic function did not change relevantly during hemodialysis.

Conclusion: There are several important aspects of these preliminary results of the prospective PEPPER- study:

1. Echocardiography indicates on a very high prevalence of pulmonary hypertension in patients with ESRD.

2. We would advise non- invasive and/or invasive screening for P(A)H in patients with ESRD only after hemodialysis to avoid false positive results and inadequate invasive testing.

3. Volume depletion during hemodialysis or hemodialysis itself directly affects RV- deformation capabilities and RV- function as detectable with 2D-strain analysis and 3D- echocardiography.

Further results of the ongoing PEPPER- study will clarify the impact of P(A)H on the outcome of patients with ESRD and it will help to identify risk factors predicting the patients´ outcomes.